

REMARKS

Applicants thank the Examiner for his indication that claims 1-8, 16, and 17 are allowed, while claim 13 is only objected to. Claims 9 and 11-15 are presented herein for reconsideration and further examination in view of the foregoing amendments and following remarks. Applicants further thank the Examiner for the telephone conference of April 13, 2004, where the Examiner indicated an amendment to pending claim 9 to indicate that the injection means was completely submerged beneath the surface of the bath of molten glass and that a cooling liquid is circulated in the injection means, along with arguments pointing out these distinctions from the cited art references, would be considered favorably. Accordingly, applicants have thus amended claim 9 and canceled claim 10 in accordance with the Examiner's suggestion.

The amendment to claim 9, in part, incorporates the limitations of canceled claim 10. Basis for the remainder of the amendment to claim 9 can be found in the original specification as filed at page 4, lines 4-8 and page 5, lines 9-11. The amendments are presented in the expectation that the amendments will place this application in condition for allowance. The amendments do not introduce new matter within the meaning of 35 U.S.C. § 132. Accordingly, entry of the amendments is respectfully requested.

Rejections under 35 U.S.C. 102(b)/103(a)

1. Claims 9, 10, 12, and 14 were rejected as anticipated by, or in the alternative, obvious over U.S. Patent No. 5,615,626 to Floyd et al.;

2. Claims 9-10 and 15 were rejected as anticipated by, or in the alternative, obvious over U.S. Patent No. 5,678,244 to Shaw et al.; and

3. Claim 11 was rejected as obvious over U.S. Patent No. 5,678,244 to Shaw et al.

Response

Applicants respectfully traverse the rejections because the test for anticipation, as well as all three prongs for a *prima facie* case of obviousness, has not been established for each of the rejections.

The test for anticipation is whether each and every element as set forth is found, either expressly or inherently described, in a single prior art reference. Verdegaal Bros. v. Union Oil Co. of California, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987); MPEP §2131. The identical invention must be shown in as complete detail as is contained in the claim. Richardson v. Suzuki Motor Co., 9 USPQ2d 1913, 1920 (Fed. Cir. 1989); MPEP §2131. The elements must also be arranged as required by the claim. In re Bond, 15 USPQ2d 1566 (Fed. Cir. 1990).

Further, to establish a *prima facie* case of obviousness, the Examiner must establish: (1) that some suggestion or motivation to modify the references exists; (2) a reasonable expectation of success; and (3) that the prior art references teach or suggest all the claim limitations. Amgen, Inc. v. Chugai Pharm. Co., 18 USPQ2d 1016, 1023 (Fed. Cir. 1991); In re Fine, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988); In re Wilson, 165 USPQ 494, 496 (C.C.P.A. 1970).

A *prima facie* case of obviousness must also include a showing

of the reasons why it would be obvious to modify the references to produce the present invention. See Ex parte Clapp, 277 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985). The Examiner bears the initial burden to provide some convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings. Id. at 974.

1. Rejections based on Floyd et al. '626.

Applicants thank the Examiner for the telephonic interview conducted on April 13, 2004. During the interview, applicants discussed the differences between the presently rejected claims and the Floyd et al. reference, including that Floyd et al. only disclose a lance (injection means) that is introduced from the top of the reactor, above the surface of the slag + waste. (See e.g., Floyd et al. Figs. 1-2, lance 42 introduced from top of reactor above surface of slag). In contrast, presently pending claim 9 has been amended, as suggested by the Examiner, to emphasize that the injection means of the claimed apparatus "are introduced into the bottom portion of said reactor beneath the surface of said bath of molten glass so that said injection means do not pass through said gas above the surface of said bath of molten glass", i.e. are not at all located above the surface of the bath of molten glass, as is clearly required by the Floyd et al. reference. Accordingly, Floyd et al. did not in any way recognize this critical feature of presently pending claim 9, removing the present grounds for

rejection.

Further, this location of the claimed injection means is essential to their ability to "not form a plug of glass at their open end", as required by present claim 9. Despite the Examiner's assertion that "it appears that the combination of cooling system and the lance top-submerged into the bath would be sufficient to prevent plug formation in the lance delivering oxygen beneath the surface of the bath", this critical feature of the present claims was further not recognized by Floyd et al.

In particular, applicants respectfully resubmit that Floyd et al.'s avoidance of clogging when the lance is delivering oxygen necessarily is limited to that period of time during which injection of oxygen occurs. In contrast, the presently claimed apparatus solves the problem of plug formation upon cessation of the flow of oxygen - i.e., when there is no oxygen flow.

The Floyd et al. patent is silent on whether clogging of the oxygen lances occurs upon cessation of injection (at which time there is no oxygen flow). Such a specific problem, avoidance of plug formation on cessation of oxygen flow, while not addressed by the Floyd et al. patent is the problem solved by the presently claimed apparatus and is crucial in the present context wherein injection takes place inside a bath of molten glass. Claim 9, on the other hand, as amended and as herein resubmitted, claims that on ceasing injection, the injection means do not form a plug of glass at their open end.

Applicants therefore respectfully submit that the Floyd et al. patent fails to teach or suggest that upon cessation of the injected oxygen flow that formation of a glass plug is avoided, as claimed in claim 9. Claim 9 is therefore further asserted to be patentable over the cited reference.

Claims 12 and 14, dependent from claim 9, are asserted to be patentable over the Floyd et al. patent for at least the same reasons that claim 9 is patentable thereover.

Accordingly, reconsideration and withdrawal of the rejection is respectfully requested.

2. Rejections based on Shaw et al. '244

Applicants again thank the Examiner for the telephonic interview conducted on April 13, 2004. During the interview, applicants discussed the differences between the presently rejected claims and the Shaw et al. reference. In particular, applicants noted that Shaw et al. require a molten bath having a molten metal phase and a fluid vitreous phase suitable for capture of chlorine disassociated from a chlorine-containing compound. In contrast, the presently claimed apparatus requires a reactor including a bath of molten glass for incineration + vitrification of organic waste, more particularly radioactive waste. The metal bath of Shaw et al. is quite different from, and does not anticipate or render obvious, the presently claimed gas bath.

In this regard, applicants note that a metal bath is a very

good heat conductor. Accordingly, any cooling inside such a metal bath has to remain a moderate cooling to avoid an important solidification around the cooling circuit. This is why, according to the Shaw et al. disclosure, the tuyere 30 does not extend significantly inside the metal and a gas (i.e. a shroud gas) is used as a cooling fluid.

In contrast, the glass bath present inside the reactor of the presently claimed apparatus is not a very good heat conductor. Accordingly, it is both possible and preferable to use and circulate a cooling liquid, rather than a cooling gas, in the cooling circuit of the injection means, as required by presently pending claim 9. This is a key advantage of the presently claimed apparatus over that disclosed by Shaw et al., as a liquid is more efficient than a gas as a cooling fluid.

In view of these key differences between the Shaw et al. reference disclosure and the presently claimed apparatus (a molten metal bath vs. a glass bath, and the resulting use of a cooling gas vs. a cooling liquid), applicants respectfully assert that Shaw et al. do not recognize all of the critical features of the presently claimed apparatus. Accordingly, the presently pending apparatus claims 9, 11, and 15 are respectfully submitted to not be anticipated or obvious in view of, and thus patentable over, the Shaw et al. reference.

Accordingly, reconsideration and withdrawal of the rejections is respectfully requested.

CONCLUSION

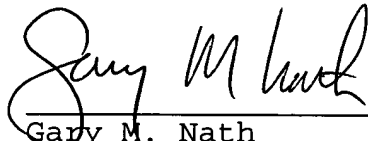
In light of the foregoing, applicants submit that all pending claims in the present application are now in condition for allowance. If the Examiner believes all the presently pending claims are not in condition for allowance, applicants respectfully requests that the Examiner contact the undersigned attorney if it is believed that such contact will expedite the prosecution of the application.

Respectfully submitted,

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